

THURSDAY, MARCH 23, 1882

## TECHNICAL EDUCATION

THE Second Annual Report of the City and Guilds of London Institute for the Advancement of Technical Education is one of great interest. It enables us, for one thing, to see what progress has been made since the issue of the first Report. There can be no doubt that, during the short period that this Institute has been in existence, it has begun effective work on a plan which will commend itself to and command the confidence of those interested in education. The movement has been started with vigour, and very soon we shall probably have a widespread system of technical schools all over the country. In London the City schools belonging to the Institute have been eminently successful, to judge from the increasing attendance, especially upon the physical and chemical classes of Professors Ayrton and Armstrong. The classes of Prof. Ayrton on "Electric Lighting and Transmission of Power" and "Electrical Instrument Making" have been so well attended that it has been necessary to make arrangements for providing additional tutorial assistance, in order that his students might receive the individual attention they require. During the past session, 551 tickets of admission to the evening classes on Technical Physics have been sold, showing a considerable increase on the attendance last year. Dr. Armstrong, Professor of Technical Chemistry, has given special instruction in the subjects of "Coal Tar Distilling" and "Spirit Rectification." The number of tickets sold has been 265. Considerable progress has been made in providing suitable new buildings for these schools, and in adding additional means of instruction and practical laboratory work. Professors Ayrton and Armstrong have been inspecting some of the best technical schools on the Continent, with a view to assist them in organising the institutions in London. Last summer, moreover, the foundation of the great Central College was laid by the Prince of Wales, who is now President of the Institute, at South Kensington, and its construction is being actively proceeded with. In this college, as the Lord Chancellor stated on that occasion, from which the entire work of the Institute will be directed, instruction of a higher and more advanced character will be given, adapted to the wants of those who will be engaged in professional or commercial pursuits, in which a knowledge of some branch of mechanics, physics, or chemistry, in its practical applications, will be found, not only serviceable, but almost indispensable. The building, when completed, will be supplied with laboratories in which the most delicate operations may be carried on; with workshops in which the various branches of mechanical and electrical engineering will be taught; with studios in which applied art may be practised, and with lecture-theatres, and class-rooms in which the principles of science will be explained.

We see from the Report that the candidates for the Institute's certificates and diplomas have greatly increased during the last year. While in the year 1880, 816 candidates were examined in 85 centres, of whom 515 passed; in 1881, 1563 candidates were examined, some

of them in two subjects, in 115 centres, of whom 895 passed, 66 of these passing in two subjects. Of the 895 successful candidates, 466 obtained the full certificate, having already passed in pure science as well as in technology. According to the new regulations, the science qualifications for the honours grade are raised, the candidate being required to produce *two* certificates in the *advanced* stage of the Department's examination. The Council attach so much importance to the preliminary training in pure science, that they look forward to the time when they will be able to require all candidates to adduce evidence of adequate scientific knowledge before being admitted to examination in technology. It was thought that the alterations in the regulations might possibly have the effect of lessening the number of students in attendance at the registered classes of the Institute during the present session; but so far is this from being the case, that whilst, according to the returns received in November, 1880, the number of students preparing for examination at 78 centres did not exceed 2500, the returns, received at the central office in November last, show that over 3300 candidates are now receiving instruction in 29 subjects at 115 centres. All this is very gratifying, for unless the candidates undergo a really testing examination both in the principles and practice of their art, unless care be taken to see that practical knowledge is based on a knowledge of scientific principles, we shall be no better off than before, but probably worse. Moreover a considerable increase is shown in the number of teachers who have been placed on the books of the Institute. The new rule which comes into operation after March 30, and which requires, except under special conditions, the candidate to have obtained the Institute's full certificate in honours in order to be registered as a teacher, will, doubtless, prevent the rate of increase of teachers from being as great in the future as it has been during the past two years. But the Council rightly feel that the success of the work in which they are engaged depends, to a great extent, on the efficiency of the teachers who are associated with it, and they think that the time has now arrived when they are justified in requiring from those who wish to be registered as teachers such evidence of their qualifications to impart technical instruction as is furnished by the Institute's Honours certificates, or by a strong recommendation from persons of recognised authority.

This is as it should be, and there is no doubt that the Institute will go on raising their examination standard, till it reaches the highest limit of efficiency as a test of knowledge of the principles and applications of science. The Institute is quite alive to the value of laboratory and workshop practice, and it does all it can to encourage and compel students not to rest content with mere book-knowledge, but to become familiar with the tools and processes themselves. The Institute is anxious to encourage the system in provincial schools, and so far as funds allow are willing to lend instruments for the purpose.

There is such evident anxiety to give both principles and practice equally fair play, that in drawing up the syllabuses of the several examinations the Council have availed themselves of the suggestions and co-operation of manufacturers; and with the view of making the examination a fair and satisfactory test of

the candidate's acquaintance with his subject, they have instructed the examiners to make the questions as practical as possible, and are endeavouring to secure the services of two examiners for each subject, one of whom at least shall be actually engaged in manufacture. At the same time it is interesting to notice that of those candidates who have not attended the ordinary registered classes, 47 in all presented themselves from University College, London; the Royal School of Mines; the Yorkshire College, Leeds; the Glasgow Technical College; the St. Mark's Technical College, Grosvenor Square; and from other similar Institutions; and of these 41 succeeded in passing, 23 in the first, and 18 in the second division, the percentage of failures being remarkably less among this than among any other class of candidates. Among changes in the technological examinations, all in the way of improvement, we may note that the subjects have been so arranged as to group together allied industries; examinations in electric lighting, the transmission of electrical energy, and electrical instrument making have been added; more sensible arrangements have been made as to the grades of the examinations; these and several other changes all tend to the efficiency of the examinations as real tests of the attainments of candidates.

From all this it seems clear that the Council of the Institute are impressed with the truth on which we have so often insisted in these columns, that there can be no efficient practice without sound principles, that instruction in the practical applications of science must be based upon a knowledge of the science which is applied, that instruction in the latter must precede instruction in the former, otherwise technical education is little better than the old empirical rule-of-thumb methods. Therefore we are glad to see, as the Lord Chancellor indicated in his speech at the laying of the foundation of the Central College last July, that the aim of the Institution will be to supplement the work of those institutions, especially the Science and Art Department, whose aim is to afford a knowledge of the principles of science and art. There is distinct evidence in the examinations of the new Institute of a gradual tightening of the tests, both for students and those who aim at being technical teachers. At the distribution of the prizes last December Sir Frederick Bramwell said that "the value of these certificates and prizes depends upon the thoroughness of the test that is applied, and it is in the interest of the certificate and prize-holders themselves that the standard of the examination should be maintained, in order that the value of the rewards may be duly appreciated. The Institute's certificates are intended to be regarded as diplomas of efficiency, and with this view they are awarded to those only who give evidence of possessing a practical as well as a theoretical knowledge of the subjects embraced by the examinations. Mere book-learning will not suffice to pass our examinations."

The City Companies have so far been wonderfully liberal in their donations to the Institute, but we hope those which have not contributed will take the advice of the Prince of Wales at the recent meeting, and lose no time in doing so. Compared with what has been spent in the Paris Conservatoire, the sum so far spent by the Institute has been a mere pittance; the City Guilds have ample funds at their command, and they could not spend

them on a better object, or one more likely to yield a rich return for the benefit of London and the country generally than in an institution that we hope one day will be comparable to that of Paris. The success already achieved is a guarantee that money devoted to the purposes of the Institute will be well spent.

The Council of the Institute are even already hindered in their work from want of funds; all over the country opportunities occur for starting technical schools in important industrial centres, but this requires a little expenditure on the part of the Institute, to encourage an adequate response from local sources. It would indeed be extremely useful if, in connection with some more of the numerous science schools of the Science and Art Department, a technical School were available for those who desired to learn some of the practical applications of the principles they had learned at the science school. This would greatly help to impress upon the public the natural order of connection between the two departments. In the arrangement for awarding the Holl Scholarships and prizes in connection with the Institute, this order is insisted on, for, among other qualifications of the scholars, they must have passed an examination in mechanics (or physics), mathematics, and chemistry, to the satisfaction of examiners appointed by the Institute. All this seems to us very encouraging; the Institute is yet young, and technical education in the real sense is in this country only a thing of yesterday; but if it be developed along the lines indicated by this report, there is every reason to hope that in time it will become an Institution of the highest national importance.

#### THE ART OF DINING

*Aristology; or, The Art of Dining.* By Thomas Walker, M.A. With Preface and Notes by Felix Summerly. 8vo. Pp. 96. (London: George Bell and Sons.)

*Food and Feeding.* By Sir Henry Thompson, F.R.C.S., &c. 8vo. (London: Frederick Warne and Co.)

THE two dinners which stand out in our memory as events in our life were of very different characters. The one consisted of brown bread and lard, washed down with some rough country wine, and was eaten in the middle of a Tyrolese glacier. The other embraced every delicacy the heart could wish. Our appreciation of the first was due to compulsory fasting for some time previously. Our appreciation of the second was due to its intrinsic merit. In it the dishes seemed to be so arranged that each one stimulated the palate for the one that succeeded it, and the wines given with each course were so selected as to increase the appetite for, and appreciation of, the solids. We then, for the first time in our life, began to realise that cookery was a fine art. In speaking of the fine arts we generally include only those which appeal to the special senses of sight and hearing, such as sculpture, painting, architecture, music, and we rarely think of modes of appealing to the special senses of smell and taste. Yet the latter two are perhaps quite as closely connected with our emotions as the former, and as capable of exciting keen sensations of pain and pleasure. Smell and taste differ from sight and hearing in being much more easily fatigued, and this may partly be the cause of their imperfect cultiva-